



Evanescent wave coupling in a geophysical system: Airborne acoustic signals from the Mw 8.1 Macquarie Ridge earthquake

Láslo G. Evers, David Brown, Kevin Heaney, Jelle Assink, Pieter Smets, and Mirjam Snellen

Royal Netherlands Meteorological Institute (KNMI), Seismology Division, De Bilt, Netherlands (evers@knmi.nl, +31302201364)

Atmospheric low frequency sound, i.e. infrasound, from underwater events has not been considered thus far, due to the high impedance contrast of the water-air interface making it almost fully reflective. Here, we report for the first time on atmospheric infrasound from a large underwater earthquake (Mw 8.1) near the Macquarie Ridge, which was recorded at 1,325 km from the epicenter. Seismic waves coupled to hydro-acoustic waves at the ocean floor, after which the energy entered the SOund Fixing And Ranging (SOFAR) channel and was detected on a hydrophone array. The energy was diffracted by a sea mount and an oceanic ridge, which acted as a secondary source, into the water column followed by coupling into the atmosphere. The latter results from evanescent wave coupling and the attendant anomalous transparency of the sea surface for very low frequency acoustic waves.